January-February 2007 ♦ VOL 35 ♦ NO 1

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Army Aviation Composite Risk Management Information

Deployment

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Army Aviation Composite Risk Management Information

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Flightfax is published monthly by the U.S. Army Combat Readiness Center, Bldg. 4905, 5th Avenue, Fort Rucker, AL 36362-5363. Address questions regarding content to the editor at 334-255-9855. To submit an article for publication, e-mail Flightfax@crc.army.mil or fax 334-255-9044. We reserve the right to edit all manuscripts. Address questions concerning distribution to 334-255-2062. Visit our Web site at https://crc.army.mil.

DASAF'S CO

From the Director of Army Safety

Mission Prep

While many Soldiers understand and already execute what I'm about to share, I offer these thoughts to help you enhance your existing practices and assist you in refining your thoughts and how you do business.

RNER

paration

During the course of duty performance, there will be times you'll have a habitual opportunity to fight from or transport in Army aircraft. The great crews that transport our Soldiers are dedicated Warriors with an intense desire to achieve mission success. Our crews are mission focused and strive for "mission accomplishment." However, I suggest you'll want to establish *mutually understood and agreed to criteria* for risk acceptance prior to wheels rolling or breaking friction with the ground.

Let me explain. In aviation (or any other functional area), crew coordination doesn't begin when an aircrew straps on an aircraft and fires up the engines. Effective aircrew coordination begins with mission receipt, planning, and with the mission briefing. That's when everybody who has a stake in the successful accomplishment of the mission discusses what has to be done, when it has to be done, and why it has to be done. It is during the mission brief when all crewmembers determine what is expected of them during each phase of flight and during contingencies.

"THE HUMAN SIDE OF ACCIDENT EQUATIONS IS OUR SINGLE LARGEST PROBLEM AREA, AND THE ONE AREA WHERE WE LOSE THE MOST SOLDIERS."

Here is where you enter the picture. Crewmembers aren't the only ones onboard or the only ones with a "stake" in mission success. As a member of the crew (or habitual passenger), you have an obligation to ensure there exists a clear understanding of "acceptable risk." The understanding of mission urgency and acceptable risk must be discussed. All personnel should clearly address and define, prior to mission initiation, what "acceptable risks" exist (such as weather, enemy or other contingencies). It is in everyone's best interest to establish the exact criteria for mission continuation prior to encountering a threat (weather, IEDs, SAFARE, obstacles, etc.) before tension and stress surface.

The human side of accident equations is our single largest problem area, and the one area where we lose the most Soldiers. Coincidentally, in this human factor is where we stand to make the greatest advances in accident reduction. One

major way of dealing with human performance or human error is to improve how our Soldiers interface, work and communicate with each other. All too often, someone knew, or had that "gut" feeling, that something was wrong before an accident sequence began. Or even worse, the habitual passenger had "no idea" of what was happening and was merely "along for the ride."

Since all personnel on board have a stake in mission accomplishment, there should be a conscious decision before mission initiation to continue the mission into an area where either the personnel or passengers are uncomfortable or unaware. The best communication and most effective coordination are absolutely essential if our Army aircrews, teams, squads, platoons, etc. are to complete their demanding missions safely and effectively. But that effective communication starts in the "crew brief" where calm prevails, not when the threat appears and stress enters the equation.

Effective operations dictate we function as a team. Just prior to an impending disaster is no time to decide what game plan we'll execute.

William H. Forrester
Brigadier General, USA
Commanding

Safety Pract

CW4 RUSTY RICE
HQDA ARMY RESERVE FORCES
POLICY COMMITTEE
WASHINGTON, D.C.

The development of a safety program in combat environments is specified in Army Regulation 385-10 and demands the attention of the commander in the depth of the requirements.

ices in Combat

Through the chain of command, the first full-time dedicated safety professional is generally found at the brigade level. At the battalion and unit level, they are additional duty safety officers. The brigade combat safety officer is a member of the brigade commander's special staff and is instrumental in implementing the safety program. The brigade combat safety officer may be a Department of Army Civilian, when available. He/she also may be a member of the HQ FORSCOM G-1 safety team as an Army Safety Augmentation Detachment member. The ASAD is assigned to fill the vacant brigade combat team safety slots as requested from the active Army deploying units.

What is the value?

Safety officers monitor and manage the Army Safety Program. Their objective is to prevent accidents by raising the level of consciousness concerning safety issues for the Soldiers on combat missions and their combat support units. By assisting the brigade commander, safety officers should do the following:

• **Make safety a force multiplier.** By focusing attention on safety issues through the units, we can keep Soldiers in the fight. My experience has shown that over a one-year period a brigade commander could expect to lose about one platoon of Soldiers as a result of accidents. This includes accidents occurring in the motor pool, during physical training and on combat missions. Accidents included falling from towers, physical training ankle fractures, negligent discharges, fratricides, traffic accidents, fires and combat vehicle rollovers. Over a 12-month period, there were more than 100 accidents.

• **Preserve equipment.** Equipment transported and shipped to the fight can stay in the fight. Enormous cost savings are gained when ground combat vehicles remain in country available for Soldiers.

• **Become the commander's eyes and ears to accident prevention.** Through accident investigations and data and causative analysis, the brigade safety officer can keep the commander informed on the units that are having accidents, the types of accidents the brigade is incurring and what courses of action should be taken to reduce the accidents and their effects. This is further enhanced by surveys and inspections. All of this is designed to enhance the safety of Soldiers already in harm's way.

Composite Risk Management

An integral part of the safety officer's value to the commander comes in training Soldiers and their leadership in the tenets of Composite Risk Management. Increasing the capability of the maneuver units to more accurately predict the hazards they may encounter on the mission and to mitigate those hazards is an integral part of the safety officer's job. The complete mission safety brief is critical to the success of the combat mission. It's all about force protection. ♦

My experience has shown that over a one-year period a brigade commander could expect to lose about one platoon of Soldiers as a result of accidents.

MANAGING AVIATION RISK IN A

LTC MARK C. PATTERSON AND CPT SAM JIN
2-10TH AVIATION REGIMENT,
FORT DRUM, N.Y.

It was a typical night in Afghanistan. The moon was still below the horizon, allowing the night to drape the country in an ominous darkness. The steady southern winds did little to lessen the effects of the stifling heat and held a steady layer of dust that would limit our visibility all night long. Yet here we were, the first of nine aircraft consisting of three different airframes from two countries, taxiing out to line-up for another mission in the mountainous valleys of the Uruzgan Province in support of a multinational ground force. What made us successful throughout Operation Enduring Freedom VII, despite the complexities we faced, was our management of composite risk.

Task Force Knighthawk was composed of a group of aviators and support personnel that had never worked together before. Our attack troop consisted of Tennessee and Idaho National Guard pilots, our heavy lift company consisted of Army Reserve pilots from four different states and our active duty Black Hawk company had never flown with the aforementioned airframes before our arrival in Kandahar. Also under our tactical control were U.S. Air Force HH-60Gs and Australian CH-47Ds.

Despite having different mission essential task lists that had not been approved by the TF commander, as well as different training standards and levels of proficiency, we were brought together to continue the fight on terrorism in Afghanistan with our transfer of authority less than two weeks away. To add to the complexity, the ground forces we were supporting consisted of U.S. Special Operations Forces and conventional forces, as well as French, Canadian, British, Dutch, Danish, Czechoslovakian and Afghan Soldiers. Each ground force had different tactics, techniques and procedures; capabilities; and understanding of proper utilization of aviation assets. These were obstacles, complicating a theatre of operation already riddled with tactical and accidental risks.

Beyond the better-known risks such as rocket-propelled grenades and improvised explosive devices, the most dangerous tactical risk is the enemy itself. We are in a constant race with the enemy to counter tactics, and one way to stay one step ahead is to conduct red-teaming. The Taliban and al Qaeda are not intellectuals, but they're not unintelligent either. Simple things such as always assuming you are being watched and adopting a frequency of changing tactics and then adjusting that frequency must not be overlooked.

COMBAT ZONE

Despite the presence of a determined enemy on the battlefield, it is the environment and its countless challenges that represent the highest threat to aircrews. High altitudes, restrictive terrain, high temperatures and lack of visual contrast are among the challenges that test an aircrew's ability to conduct missions on a daily basis. One-wheel and pinnacle landings are common, and just about every landing is a dust landing.

Our cornerstone for success was proper Composite Risk Management. Through leadership and an understanding of our abilities, as well as the enemy's, we were able to mitigate both tactical and accidental risks to the lowest level. *One of the most effective measures taken was keeping low-risk approval authority at the TF commander level for the first 90 days.* This forced interaction between the risk approval authority and the newly formed mission pilots. It allowed the TF commander to meet the pilots, convey his guidance directly and ensure missions were carried out deliberately, effectively and efficiently.

Another key to risk mitigation was training, so every opportunity was utilized. During periods of good illumination, all missions were conducted under night vision goggles to build proficiency among aircrew members. We forced the ground force commander to plan resupply and other missions at night to build proficiency for both aircrew members and ground units. We conducted close combat attack training with all coalition forces to ensure proper understanding of utilization of our attack assets. Pilots practiced pinnacle and dust landings to hone their skills and make those maneuvers almost second nature. Remember, you're in a combat zone and oftentimes you conduct training at the end of a mission. You must maximize the duty day while pushing controlled training events to build your bench. Don't count on getting dedicated training days.

Units must also advise the ground force of slope impacts and hazards. We can't allow a ground force member to get hit by a main rotor because we failed to

do the proper analysis and ensure personnel remained on the ground and in the prone position until after the aircraft departed. Ensuring the ground force understands air-ground integration is key; this is not limited to attack assets. You must give information, ask for read-backs and then confirm collective understanding. Without consistent feedback to and from the ground force, the mission is doomed.

Air mission commanders and mission briefers must be trained by the TF commander. AMCs must be taught how to think. A simple *if-and-then* methodology is a technique: *If* you know the enemy *and* you understand the friendly unit's disposition, *then* you can make a deliberate decision. Also, while it is important to allow the AMC some tactical initiative, in general, it is important to stick to the mission. For example, if the mission is to conduct a resupply and the flight gets engaged en route, suppress then bypass. Don't allow yourself to get into a sustained firefight.

Extensive scenario-based rules of engagement classes also improve responsiveness and ultimately save lives. Crewmembers must thoroughly understand the ROE. If attacked, door gunners, in accordance with the ROE, must engage. ROE training must be continuous and incorporate lessons learned. In one instance, we had a crewmember not wanting to return fire because there were civilians nearby. However, during the debrief, the crew noted an open area across from the enemy and the civilians. We must train our crewmembers to lay down suppressive fire, in this case, in the open field. In most instances, that will stop the incoming fire.

The integration of combined arms could be the difference from an aircraft going down or not. If we do our job right, we should let combined arms assets take out enemy positions. If you can kill the enemy with something else without exposing yourself, do it. Also, you must determine and use the right aircraft, capabilities and munitions for the mission. The CH-47 is a big target, and the enemy knows the information operations effects of shooting one down.

Enforcing the basics should be a matter of routine. Do not allow hovering flight unless preparing to land. Airspeeds

must be maintained at 60 knots indicated airspeed or greater or you get into power management while becoming extremely vulnerable to enemy fire, an unfortunate convergence of an elevated tactical and accidental risk profile. Additionally, variations in speed, offsetting terrain and changing the flight path and formation keep the enemy guessing. By not following linear features such as roads or riverbeds and avoiding flights over towns and villages, you mitigate risk.

An important part of proper preparation lies with the staff. The effort put forth by the staff ensures aircrews are equipped properly to conduct the mission safely. Teamwork between air and ground assets is crucial. The mission, regardless of our day-to-day role, is to pursue and destroy the enemy. The key is to analyze the mission and determine the best asset to execute the mission whether it is aircraft, ground forces or both. In this manner, we matched the proper capabilities with mission requirements.

Air briefs were crucial in aligning the assets into one scheme of maneuver. The air scheme of maneuver, as well as the ground scheme of maneuver, was briefed using common graphics. This allowed for a greater understanding of the mission, situational awareness and airspace deconfliction. In turn, these measures served as fratricide prevention and increased our ability to engage the enemy.

Finally, a thorough rehearsal helped to bring all the training and preparation together. Walking through the mission using TOPSCENE and different map scales and discussing actions on the objective allows all aircrew members and ground force commanders to visualize, describe and direct actions on the objective in order to gain and maintain contact with the enemy.

Above all, we had to understand not only our strengths and weaknesses, but also those of the enemy. In order to defeat the enemy, we had to remain unpredictable. We altered our routes, used different tactics and changed aircraft packages whenever we could. Aviators learned to vary their patterns and altitudes and to use terrain and environmental factors to enhance their cover. We utilized jump FARPs and the FATCOW in order to change our capabilities, extend our force projection and to demonstrate to the AMC we were not limited to the well-established FARPs. We kept aircrews informed by producing and publishing daily intelligence summaries and operational summaries for all enemy and friendly activities. We also briefed the information at quick-reaction forces briefs, all mission air briefs and at twice-daily shift change briefs to ensure proper dissemination of information to all Soldiers within the TF.

Despite the complexities of war and the further obstacles created by fighting alongside a multinational force, the treacherous terrain and weather and the aggressive and illusive enemy, TF Knighthawk was able to conduct a successful deployment. Proper use of CRM allowed us to support the ground units in combat and combat service support missions throughout southern Afghanistan. Leading on the Edge!

Find It On The G

CW4 PRINCETON SOH
C COMPANY, 2/82 AVIATION REGIMENT
FORT BRAGG, N.C.

I was a UH-60L pilot in command during a multiship formation field training exercise. Our mission was to sling load 105 mm howitzers and their crew from one point to another about 20 minutes away under night vision goggles.

Our formation arrived late in the afternoon, and each crew met with the air mission commander and the supported unit for an update before performing the mission. During the briefing, we were told the landing zone had become obscured by fog. The decision was made to cancel the mission and leave our aircraft in the pickup zone while we dispatched ground vehicles to transport the crews back to the field site. Each crew was told they should return to their aircraft and await further instructions.

Upon returning to my aircraft, the crew and I promptly secured the rotor blades and all required covers. We then piled into the cabin to help ourselves to some meals, ready-to-eat. A few minutes into our meal, the other crews in our flight started their auxiliary power units. Thinking they were just performing radio checks, we stuck our heads out of the cabin doors to see what was going on. We noticed every other crew in the flight had started their APUs and some were starting their engines. As I put on my gear to get the radio online, I yelled to my crew to get the aircraft ready. Just as I got system power, I could hear over the radio that the flight was indeed getting ready for takeoff.

"I RUSHED THROUGH THE CHECKLIST ... "

I rushed through the checklist to get the engines started and called out to the crew chiefs to finish untying the aircraft. We managed to get our goggles on and focused just in time to hear the flight crew call in their status.

We were still behind the rest of the flight, but we continued to rush through our start. Once we were caught up, I took a moment to double-check the cockpit switches. Lights, switches, doors secured … then I looked out my window and noticed something flapping behind my shoulder. Pitot cover! I called to the crew chiefs to check the Pitot tubes and make sure the covers were off. They weren't—and we were just about to take off. The crew chiefs quickly secured the

covers and we were off for a flight back to the assembly area.

Since then, I've pictured in my mind what could've happened if the covers had been left on. In my haste to get the aircraft started, I gave up my *routine* of a before-flight walk-around and instead decided to focus on getting the engines started. Additionally, I knew we were behind the rest of the flight, which accelerated my motivation to get up in the air. I'm lucky to have seen the Pitot covers when I did. We could've easily rushed into an accident. Yep, it's always better to find a mistake on the ground than in the air. ♦

DON'T TAKE ANYONE'S WORD FOR IT

The regiment was getting two units ready to deploy for a battle group exercise, and we had two aircraft in phase D inspections. With most of our units deployed, we had only a small number of people left around, so everyone—including the quality assurance representative (QAR)—was doing maintenance and inspections.

I'm a power plant QAR in a UH-60 unit. Being a QAR had been a real learning experience for me, but I was starting to feel confident in my ability to do the job.

While I was helping break down a spindle assembly, I was asked to inspect the greasing of a disconnect coupling. I walked over to the other aircraft in phase D and watched mechanics grease the disconnect coupling and torque the mount bolts for the aft end of the No. 5 driveshaft.

The phase card says to fold the tail and then to inspect and grease the disconnect input and output jaws. The sergeant working the task cards said he would do it when he had enough people to fold the pylon. I told him I would sign off the cards after he inspected and greased the jaws. I then went back to help break down the spindles on another aircraft.

Later that day, the noncommissioned officer in charge and phase coordinator asked me to sign off the cards for any work I witnessed for their aircraft. I pulled out the phase cards for the disconnect coupling and read through them to make sure I hadn't missed anything. When I came across the inspection and greasing of the disconnect jaws, I remembered I hadn't been able to witness that because the tail pylon was spread.

I asked the sergeant, "Was this part of the card completed?" The answer I got was, "Yes, but we've already spread the tail again." I looked at him, paused for a minute, said "Okay" and signed off the cards. The NCOIC and the phase coordinator said nothing.

Two days later, the aircraft flew a functional check flight and logged 10.1 hours over five days. After four daily turnaround inspections, we discovered during a 30-hour inspection that the disconnect jaws hadn't been greased.

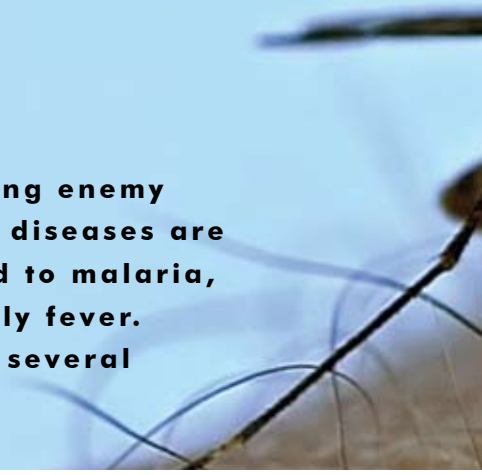
I was the main person at fault because I didn't inspect what I'd signed for. My shortcut could have cost people their lives or caused extensive damage to the aircraft. Still, it cost the unit a lot of man hours and parts to replace the couplings that had been damaged from operating without grease.

Shortcuts and high-tempo schedules can lead to disaster. I relearned some basics, not the least of which was supervise all required maintenance. Verify each step and scrutinize the pubs and maintenance requirement cards that pertain to each procedure. As a QAR, you're there to make sure everything is done correctly the first time. Don't take anyone's word for it. ♦

Editor's note: Although this article was written by a member of the U.S. Navy, the same rules apply to our Army brethren. The author's name was withheld by request. If you would like to publish a story anonymously, please contact the editor by e-mail at paula.allman@us.army.mil.

Take Cover!

CPT ROBERT NUTTER, APA, AND LTC NICK PIANTANIDA, M.D.
HHC, 3-10TH GENERAL SUPPORT AVIATION BATTALION
TASK FORCE CENTAUR FS, OEF-07
APO AE 09354



Insects are a disease-propelling, performance-degrading enemy force our Soldiers must battle every day. Vector-borne diseases are numerous in Afghanistan, and a Soldier can be exposed to malaria, leishmaniasis, West Nile virus, scrub typhus and sand fly fever. Let's take a look at a few of these diseases, as well as several measures that can keep you from becoming a casualty.

MALARIA

Malaria has a variable attack rate in Afghanistan, infecting up to 11 to 50 percent of Soldiers not taking protective countermeasures. The disease is passed to humans from the bite of an infected female Anopheles mosquito. Transmission occurs rapidly, with overt symptoms—including high fevers, shaking chills, sweats, headaches and muscle and joint pain—occurring 10 days to four weeks later. Other nonspecific symptoms such as nausea, vomiting and stomach pain are easily misrepresented as other ailments. The vivax form of malaria may lay dormant for one year and requires specific preventive treatments, which will be discussed later in this article.

LEISHMANIASIS

Leishmaniasis is transmitted by the parasite-carrying Phlebotomus species of sand fly. The highest occurrence of cutaneous leishmaniasis in the world has been in Kabul, Afghanistan, with an estimated 67,500 to 200,000 cases each year. The sand fly is only about one-third the size of a typical mosquito and acquires its victim without a sound. Its bite degrades into an open, ulcerated, slow-healing sore that lasts for months, forming a scar. Whereas cutaneous leishmaniasis is a locally limited parasitic infestation, visceral leishmaniasis, a severe systemic disease, is less prevalent in Afghanistan.

WEST NILE VIRUS

The mosquito transmission rate of West Nile virus is variable, which means not all victims demonstrate symptoms. Symptoms, including fever, malaise and headache, typically appear within three to 14 days of being attacked and persist for two to seven days. The virus can cause a more serious brain infection, aseptic meningitis or encephalitis. A Soldier with meningitis could experience sudden high fever and headache, stiff neck, tremors, disorientation and coma. Meningitis or encephalitis requires prompt recognition and treatment.

PREVENTION

Self-protective measures start with understanding the vector insect attack patterns. The enemy's peak attack times are between dusk and dawn from May through November. Malaria's highest attack rates occur at elevations below 2,000 meters. The optimum temperature range for mosquito vector and parasite development is 68 to 86 F.

Mosquitoes need water to breed and grow, so don't give them a chance. Get rid of places where water collects, reducing puddle formation. Empty anything that holds standing water—old tires, barrels and buckets.

Statistics tell us the most effective mosquito defense mechanism available to Soldiers includes the wearing of a Permethrin-treated Advanced Combat Uniform and the application of DEET. Soldiers should consider treating their physical training uniforms with Permethrin. **However, aviation Nomex® should NOT be treated with Permethrin since it reduces the Nomex® flammable protective properties.**

Frequent applications of DEET ensures continuous protection. Laboratory testing shows the

one TINY ENEMY

Because of a caution light, the CH-47 crew was forced to make an immediate precautionary landing in the northeast region of Afghanistan. The damage assessment and response team arrived on the scene and spent the entire night replacing the transmission while the five aircrew members assisted with security. Unfortunately, the crew neglected to protect themselves from one tiny enemy. By next morning, four of them were covered with insect bites on their arms, legs, faces and necks. A few weeks later, two of them were battling malaria.

The CH-47 pilot was the first to come down with the early symptoms of the disease, which included abdominal pain, cycling fevers and severe fatigue. He later developed liver enzyme elevations and a drop in platelets and red and white blood cells. Several thick/thin blood smears initially proved inconclusive for malaria; however, following the arrival of a new test kit, the pilot tested positive for Plasmodium falciparum, the most lethal type of malaria.

The aviator was grounded and subsequently went through two cycles of Malarone, a malaria treatment, before antigen tests and thick/thin smears were negative for the disease. Following about three weeks of no-flight duty, the pilot returned to duty when his liver enzymes and blood cell indices normalized.

Shortly after the pilot began experiencing symptoms of malaria, a door gunner made three visits to a clinic

military DEET lotion provides protection for 10 hours in a hot, dry environment. When applying both DEET and sunscreen, apply the sunscreen approximately 30 minutes to one hour before applying the DEET so the sunscreen has time to bind to the skin. Finally, wear your sleeves down, your undershirt tucked into your pants and pant legs tucked into your boots. By minimizing exposed skin and applying insect repellent, attack rates are greatly reduced. For other protective measures, visit the U.S. Army Center for Health Promotion and Preventive Medicine's Web sit at **http://chppm-www.apgea.army.mil.**

All Soldiers deployed to Afghanistan must take a scheduled dose of malaria prophylaxis. For flight status Soldiers, the preferred medication is a daily 100-mg dose of Doxycycline. Redeploying Soldiers must continue the Doxycycline for four weeks, adding Primaquine during the last two weeks. Primaquine defeats the dormant parasites from the vivax species. Unfortunately, there are no anti-leishmaniasis or West Nile virus medications or vaccines.

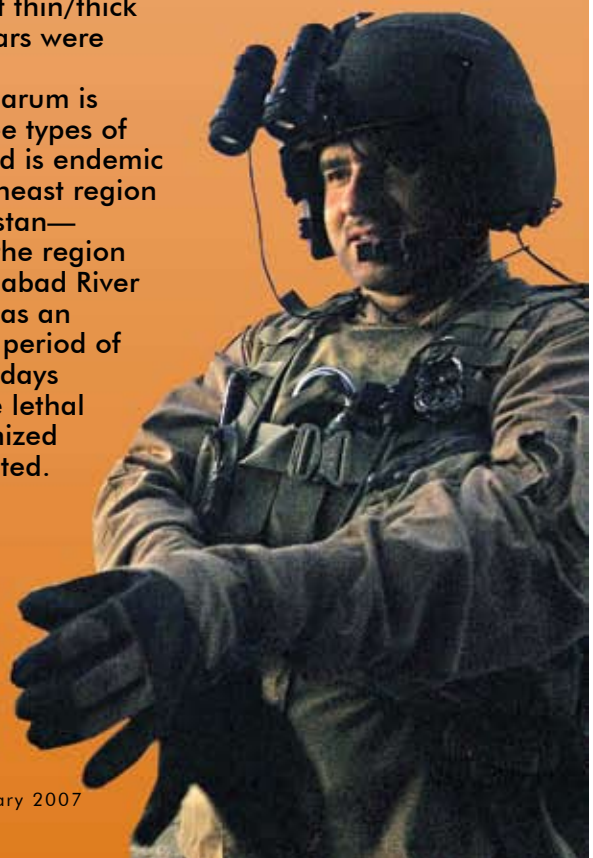
Remember, the enemies in Afghanistan also include the small vector-borne varieties that seek opportune moments to attack. Applying these valuable preventive measures will certainly outweigh the lost time from work, the cost of treating a disease and the agony it causes a Soldier and his family. Remember to always take cover! ♦

over a five-day period for nearly passing out following the acute onset of a headache and fever. At each visit, the crewmember was found to be suffering from severe dehydration with an accompanying fast heartbeat and unstable blood pressure.

The door gunner's labs showed the same liver enzyme elevation and drops in critical blood cell lines as the pilot's, yet his initial thick/thin blood smears from his first two visits to the clinic were inconclusive or negative. However, the smears and antigen testing from the crewmember's third visit were positive for falciparum. The crewmember was grounded and responded well to one round of Malarone. He was returned to flight duty two weeks later when his lab tests normalized and subsequent thin/thick blood smears were negative.

P. falciparum is one of three types of malaria and is endemic to the northeast region of Afghanistan—especially the region of the Jalalabad River Valley. It has an incubation period of nine to 30 days and can be lethal if unrecognized and untreated. Unlike our infantry comrades, who have the benefit of permetherine-treated uniforms, our aircrews must rely on their daily anti-malaria prophylaxis medicine (Doxycycline) and DEET. Although the door gunner was taking Doxycycline, the pilot was not because of a misunderstanding related to childhood allergy to a similar medicine. He now takes Doxycycline faithfully each day.

One lesson learned here, though, is our Air Warrior vests all contain DEET inside. None of these crewmembers were aware of that fact. I hope this story and lessons learned serve the broader aviation community in safe practices in vector disease prevention. ♦



Thinking Rede

CW4 KURT CALLAHAN
1-10TH AVIATION BATTALION
FORT DRUM, N.Y.

I just wanted to take a minute and discuss redeployment and what we can do to make it successful. Our unit, 1-10th Aviation, just returned from an 11-month tour in Iraq. The tour went well. Our commander was very receptive to my concerns as the unit's aviation safety officer and the recommended corrections throughout the tour. As we got to the six- to eight-month mark, we started working on a redeployment plan.

As anyone who has read the U.S. Army Combat Readiness Center's preliminary loss reports knows, we are losing many Soldiers to the "getting-home phase." I would like to pass along our plan to generate a discussion and perhaps stimulate thought.

First, we actually did have a safety stand-down day in a combat zone in a hostile city. For this we needed the support of the ground brigade commander, a little help from a sister unit and our own command support. We executed the safety stand-down with 95 percent attendance, with the 5 percent who were on quick-reaction force making up the training later. Classes were focused on accident review during our deployment and lessons learned, a reminder that many accidents happen at the end of the rotation. A few classes also focused on what lies in wait for us when we finally get home. I used many of the videos from the USACRC Web site (again, great job by the USACRC), but the one that had the most impact was the family video "Living Without Josh."

Second, during the redeployment briefs, my brief became required. It was interesting to note that briefs like

▸ https://crc.army.mil/Multimedia/

ployment

finance, health assessment and others were documented, tracked and checked off. However, you had to dig deep to find the requirements to have a safety brief focusing on redeployment, especially given the amount of redeployment-related deaths and injuries. Again, support and direction from our command made the brief mandatory. I gave a second brief to all Soldiers in conjunction with the rest of the redeployment briefs. This brief focused on the hazards upon returning home. Again, the USACRC videos were a staple, along with segments from the United Services Automobile Association (USAA) driving class series. USAA sent me the training package in Iraq, along with drunk-and-distracted driving goggles.

Third, all Soldiers, as they arrived at home station (while their bags were being off loaded and customs had the dogs on them), got another prepared oral brief from their chalk leader. Each chalk leader was briefed by the task force commander as to his intent and expectations. This brief reinforced all the briefs we'd conducted in the first two phases. It also included some topics covered by other sections such as reunion issues. At this time, all Soldiers were given a taxi card and key phone numbers. Phone numbers are very important, as the unit has become reliant on each other and could, at any time, just knock on someone's door. Most phones were turned off during the deployment. Having a phone plan and a receptive rear detachment was important for all issues from basic to emergency.

Having a lodgment plan for geographical bachelors and single Soldiers was also important. Providing basic housing for a limited time reduces problems significantly. A unit van was available for Soldiers to get to the PX and places to get food and other needs. Access to privately owned vehicles in storage was made available the next day and was part of the seven-day process. The first two days allowed Soldiers time to sleep off the jet lag, get to know their families once again and refamiliarize themselves with the local area. These two days also allowed Soldiers to have their vehicles inspected by a mechanic and registered on post. No vehicle left storage if it failed a POV inspection. Soldiers were told well in advance of leaving country that this was a requirement and to check their license, registration and inspection data.

Finally, we conducted a seven-day reverse Soldier readiness checks, or SRC, process. It seems painful and stupid (trust me, I heard it plenty), but it allows Soldiers to ease into garrison and family life and still have contact with the people they just spent a year with. We had a basic half-day schedule doing the out-processing-type stuff, and then the rest of the day was for the Soldiers. This also helps single Soldiers because their buddies are still there to assist with rides and getting things fixed.

The last day of the SRC, the chalk leaders of all flights sat down with each Soldier and reviewed their ASMIS-2 printout (done on the third day of R-SRC with computers provided by rear detachment), discussed their plans for travel and return and reviewed each Soldier's contract. The contract was a discussion of the trends within the Army for incidents between the leader and the Soldier. A few leaders didn't like this, but it was one last chance to interface with the Soldier before sending him or her on leave for 30 days.

I'm not sure if this process is appealing to everyone, and not all Soldiers need these briefs. But, I will say all our Soldiers are back from block leave except those who had extended leave with no incidents and no DUIs. ♦

For Your Information:
Before you head out on the open road, go to the USACRC's Web site at **https://crc.army.mil** and complete the ASMIS-2 POV risk assessment form. It's quick, easy and will help make sure your trip is a safe one.

Peace Can Kill

CW4 MALCOLM MCCUTCHEON, CW4 DENNIS L. NILES, CW4 PABLO QUIRINDONGO, CW3 RICHARD MCCLELLAND, CW3 PEYTON SUPERNAW AND CW3 GLEN E. WEBB JR.
WARRANT OFFICER STAFF COURSE 05-04

After 14 long months in Iraq, we were finally home. Before redeploying back to the States, we received our "get-home-itis" safety brief designed to smoothly transition troops from the combat zone to home station. Troops and family members alike were eagerly anticipating reuniting after a year of untold hardships—both in Iraq and at home. Returning home! The urgency of combat operations was no longer present. It would be criminal to have our fellow brethren return home safely, only to lose them through carelessness, poor leadership or negligence.

Redeployment training ideally should begin several months before arriving at the port. The Army mandates Soldiers attend classes to aid them in returning to home station safely. But other than the core Army classes, the aviation community, for the most part, is responsible for ensuring redeployment training is complete. What should a unit consider when developing this training syllabus?

Once aircraft are back at home station is not the time to consider if aircrews are ready to fly. In fact, if possible, it is usually best to have a sister unit pick up your aircraft since your unit's pilots may not be proficient or even current after block leave and recovery. Listed below are some items to ensure your unit's success in redeployment recovery operations.

SAFETY

• **Enforce the standard.** There is only one standard, but during a time of war, risks are higher and mission requirements may be placed ahead of normal safety considerations. Remember armament and range procedures. Flight and survival gear requirements are different in a peacetime environment.

Also keep in mind that "land as soon as possible" no longer requires you to fly back to friendly forces. Now that you're back in a peacetime environment, land as soon as possible means land at the nearest suitable area without delay.

IT WOULD BE CRIMINAL TO HAVE OUR FELLOW BRETHREN RETURN HOME SAFELY, ONLY TO LOSE THEM THROUGH CARELESSNESS, POOR LEADERSHIP OR NEGLIGENCE.

RECORDS

• **Individual aircrew training folder.** Is the IATF complete and up-to-date? Have all required evaluations and minimums been completed or waived? If any requirements were waived, how long is the waiver current? Are all signatures and task lists up-to-date? Does the individual have to fly with an instructor pilot upon return to home station?

• **Medical records.** Does the crewmember have a current flight physical or is he on an extension? If an extension is granted, ensure the flight physical is completed within the prescribed time.

• **Individual flight records folder.** Does the crewmember have a current Department of Army Form 759 and does it annotate the required entries? Are all waivers and extensions annotated?

• **Individual pilot readiness.** Some pilots have flown so much in theater that they could become complacent. This is a common tendency for aviators who have flown almost every day in a hostile environment but are now in the "nonhazardous" airspace. Take such intense flying and add a couple of months of not flying, and the individual's piloting skills may have become rusty. The unit standardization pilot should evaluate the capabilities of each pilot. This doesn't mean every pilot gets a checkride, but in some cases a flight evaluation may be necessary. Things to consider: what is the experience level of each pilot and what flight conditions are they weak in? Instrument flight training was almost nonexistent while deployed, so will a trip to the simulator be necessary? A new pilot who was designated a pilot in command in country might need to be re-evaluated or retrained to ensure he is capable of operating safely in the national airspace system.

• **Aircraft.** Maintenance personnel should ensure aircraft are thoroughly preflighted before leaving the docks. After being flown hard for more than a year and having possible battle damage maintenance, aircrews need to give the aircraft an extensive and thorough preflight.

• **Standing operating procedures.** Now is the time to update your SOPs to reflect lessons learned and get the entire unit on the same sheet of music. Additionally, SPs need to check for local procedures that might have changed. This is extremely important considering you may have pilots in the rear detachment, companies that have operated independently and companies that have been consolidated to form task forces made up of various aircraft types.

These are a few of the items that need to be completed while a unit is in its recovery phase and returning from block leave. Do any of these items look familiar? You can look at this training as a mini-Army Readiness Management System inspection that you give yourself. This could be the best way to know if you are once again the well oiled unit you were before redeployment and lessen your chances of being another statistic in the U.S. Army Combat Readiness Center database. ♦

NEED MORE SLEEP

Almost without fail, the human factor most frequently discussed in aviation operations is fatigue. This problem isn't unique to aviation alone, however; the physiological and psychological stressors associated with rotating work hours, cumulative operational fatigue and sleep loss affect every Soldier's performance. This article only briefly defines fatigue as part of rotating operations and sleep deprivation, but I challenge you to take stock in measures to mitigate the hazards created by too-tired Soldiers.

How is our sleep cycle established?

Circadian rhythms are natural, periodic oscillations in human function based on a 24-hour cycle. The circadian system functions as an internal clock that sets the time for sleep and wakefulness. We reset our internal clocks every day by getting up at the same time, reporting to work at a given repetitive time and, more importantly, by being exposed to sunlight at these times. Coupled with your own schedule, the sun is the key to maintaining circadian rhythm.

A desynchronized circadian system is similar to a symphony orchestra without a conductor. Many factors can desynchronize the circadian system, including alterations in biologic function such as diet or sleep, maladapted environmental cues such as light, temperature, noise or vibration, and social influences like drugs, alcohol or stress. Circadian disharmony results in symptoms of malaise and fatigue as well as certain gastrointestinal problems. In time, sleep loss and workload pressure adversely interact with an individual's circadian rhythm to reduce their reaction time, decrease vigilance and distort cognitive thinking and perceptual function.

What constitutes restorative sleep?

Sleep is like food and water in terms of a basic human requirement. Restorative sleep is defined by four cycles of stage 1 to 4 sleep and one cycle of REM, or dream state, sleep. Sleep efficiency varies between individuals and circumstances; however, as a general rule, a restorative sleep cycle can occur within five to six hours of continuous sleep.

Are you challenged with rotating shifts?

Constantly changing work shifts, such as quick reaction force or night duty, challenge the body to make circadian adjustments. Studies show it takes one day for each hour shifted into the work zone. Obviously we can function during this transition period, but we're less than efficient and proficient in our mental and physical performance. Such schedule adjustments maximize human error between 2330 and 0130 Zulu on your night-adjusted clock. When you're adjusted to your new schedule, however, avoid or minimize morning exposure to sunlight. Too much exposure will desynchronize your night-adjusted clock.

Is there any rest for the weary?

In the 1990s, NASA introduced a program called "Alertness Management." NASA scientists linked the long-haul requirement of space flight with the real-world challenges of sleep management and safety in operations. NASA scientists demonstrated that when individual sleep requirements were not met daily, a sleep debt accumulated. They further determined this sleep debt could be paid off in small installments over time, which is the concept behind fighter management. Finally, they described the "NASA nap" as part of an optimal system of fatigue

LTC NICK PIANTANIDA
TASK FORCE CENTAUR
FLIGHT SURGEON
FORT DRUM, N.Y.

countermeasures. The NASA nap lasts exactly 40 minutes and takes full advantage of all four sleep stages, but be sure to avoid all naps—however short—within four hours of an approaching sleep cycle.

What are the best measures to stay awake?

Caffeine is the supplement of choice for most people, but timing is important. Never consume caffeine within four hours of an approaching sleep cycle because it will probably keep you awake. Conversely, carbohydrates and sugary foods induce sleep, but small meals or snacks rich in protein or fiber are proven stop-gap measures to fight off fatigue. Don't forget about exercise, which is your body's natural way of creating energy stores for later use. Maximize your health and fitness with 30- to 40-minute installments of exercise most days of the week, and hydrate regularly with water. Aggressively manage boredom with physical and mental activities on the job. Get up and walk around if you're feeling tired for an instant energy boost.

Operational mission requirements in Iraq and Afghanistan will press unit leaders and their Soldiers to manage workloads under recurrent cycles of fatigue. Fighter management and the countermeasures listed here are vital steps in safeguarding the goal to "finish strong" and "finish safe." Always lead on the edge, but get a good night's (or day's) sleep first! ♦

For Your Information:
According to a 2000 study published in the British scientific journal, researchers in Australia and New Zealand reported that sleep deprivation can have some of the same hazardous effects as being drunk. Getting less than 6 hours a night can affect coordination, judgment and reaction time.
— www.wikipedia.org

I FEEL YOUR PAIN

LTC ROBERT M. WILDZUNAS, SGT L.V. PALACIO, DR. P.A. LEDUC, MS. T.N. ROUSE & MS. L.S. MILAM
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It seems the words fatigue and Soldier are almost synonymous. These two words together can spell disaster for all Soldiers, but it's especially true in the aviation community.

Numerous investigations have focused on ways to alleviate and/or eliminate fatigue in aviation, and several studies involving stimulants have been conducted at the U.S. Army Aeromedical Research Laboratory using similar test schedules for simulator flights and mood evaluations. A recent dual-pilot study indicates, oddly enough, that some stimulants resulted in nearly equal performance as compared to previous single-pilot studies that examined twice the dosage of the same drugs. Since it's unlikely the lower doses of these stimulants produced the same behaviors to the same degree as the higher doses, psychosocial interaction—the interaction between the two pilots—provides the most plausible explanation for these results in dual-pilot crews.

To remove confounds of the drug and dosage, we isolated the psychosocial component of these studies by comparing mood and flight performance among the various placebo groups during comparable periods of sleep deprivation. Simulator flights focused on simple flight maneuvers. Regarding mood data, the Profile of Mood States and Visual Analog Scale were administered during similar times throughout the testing schedule. The POMS measured factors such as tension, depression, anger, vigor, fatigue and confusion. The VAS questionnaire asked how alert, anxious, energetic, confident, irritable, jittery, sleepy and talkative the test subjects were.

Analyses of these data found both groups demonstrated equal overall flight performance. Mood reports indicated the dual-pilot group reported significantly lower levels of tension and depression but higher levels of anger, anxiety and jitteriness. In general, however, the dual-crew teams exhibited significant trends toward lower negative mood traits and higher positive mood traits. Additionally, as compared to their baseline mood states, they took longer to reach their maximum moodiness (whether positive or negative) during periods of extended wakefulness than single-pilot crews.

The pilots in our dual-pilot studies seemed more social, more agreeable and less likely to express discomfort or complain than single subjects. Interactions between them, their copilot and the research staff indicated no loss of temper or social withdrawal as had been seen in previous studies. The pilots' mood data suggests they internalized any negative feelings and still were motivated by their copilot to perform. In addition, they felt they had not only a copilot but also a confidant and someone who could relate to their situation, in this case sleep deprivation.

These findings generally indicate pilots flying as a crew tend to motivate each other to do well and feel better. The psychosocial environment seemingly has significant effects on pilot mood during periods of sleep deprivation. These data underscore the need to examine the resilience and vulnerability of team behavior as a fatigue countermeasure. By doing so, we'll be better able to prepare our Soldiers for situations where fatigue can cause mission problems while they keep alert and look out for one another in the combat zone. ♦

're Only Human

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U.S. ARMY RESEARCH INSTITUTE OF ENVIRONMENTAL MEDICINE
NATICK, MASS.

"The human is the weakest link." This statement often can be heard when people describe accidents of any sort. Given the complexity of the machinery and computer technology that make up today's aircraft, it's mind-bending to think humans would be the weakest link. Surely components will break and computers will fail more than an aircrew! On the other hand, could it be that machine parts and computer processes perform consistently, whereas humans are more easily affected by situations, environments and personal factors? This is a question that plagues the field of human factors.

The Army Aviation environment is ripe for human error due to such factors as operational tempo and the addition of advanced technology in the cockpit. For example, modern aircraft with multifunction displays often have increased capabilities over their traditional counterparts (e.g., map displays vs. kneeboards and paper maps). This increase in functionality might not only increase the amount of information available to aviators in the cockpit, but also the missions and tasks they are responsible for while in flight. The addition of functions and tasks requires pilots to spend more time managing the aircraft as opposed to flying it.

Essentially, the more time pilots need to spend inside the cockpit managing the aircraft and flight systems, the less time and attention they have to direct toward keeping the aircraft in flight and away from obstacles. Increased heads-down time in the cockpit can significantly impair pilots' abilities to maintain situational awareness and properly coordinate their and their crew's actions. The combination of these factors might lead to increased aircraft accidents due to human error.

Within the aviation realm, it's common to hear the statistic that 80 percent of accidents are due to human error. In fact, there are whole divisions of researchers working on these questions, trying to determine the incidence of human error, the best way to classify accidents and how to catalog human error in these accidents. The reason for this push is the need to learn from past mishaps to improve risk management and reduce the potential for future accidents. To state the obvious,

the Army is very concerned with risk management and the reduction of accidents. After all, you're reading this magazine, which is published by the U.S. Army Combat Readiness Center!

While the USACRC is the organization primarily responsible for accident investigations and analysis, the information gathered by their investigators is useful for many in the human factors field. Their Risk Management Information System Web site provides information regarding accident rates and statistics as well as details about accident causes and recommendations. Researchers use this information to answer some human factors questions.

There are several frameworks used by different organizations and researchers to evaluate accidents and their causes. Before getting to the big questions regarding human error in Army Aviation accidents, let's review a few facts about accident data. We all know that aviation accidents can be called flight, flight-related or ground accidents depending on their circumstances and are classified according to their severity as Class A, B, C, D or E. Accident investigators determine the causes (environment, materiel or human error) of each accident to answer the question of *what happened*. Investigators also evaluate system inadequacies or root causes in each accident to determine *why the accident happened*. This additional classification allows for a more detailed understanding of hazards present in aviation operations.

The system inadequacies or root causes considered include support, standards, training and leader and individual failures. Of course, many accidents have more than one causal factor and multiple root causes. For our current purposes, we're interested in examining human error more closely and also looking specifically at individual failures present in those human error accidents.

One important question in analyzing Army Aviation safety is, "How often is human error a cause of accidents?" However, acknowledging the presence of human error is merely the first step. A more complete understanding can be developed only when looking at the root causes of accidents. Many accidents have several root causes, all of which are important. Yet the individual failure category contains failures that are tied directly to the crewmembers and are most typical when thinking about human error. Some of these individual failures include overconfidence, complacency, crew coordination lapses, crew issues and distraction due to high workload. While it's not possible in the space allotted here to define every possible individual failure, here are a few descriptions and examples.

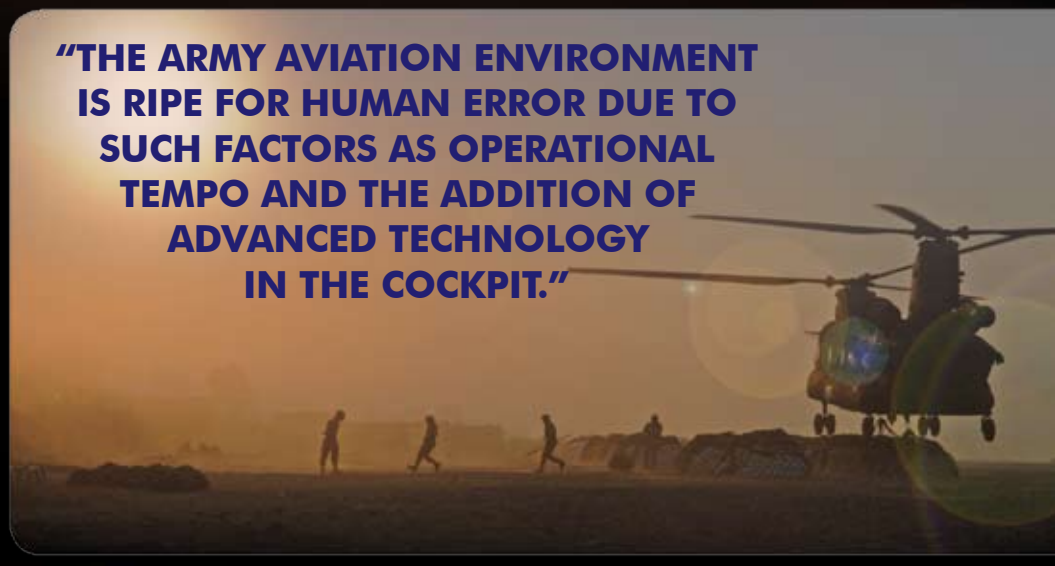
Overconfidence and complacency

These two attitudes often are found in similar situations. They're both tied to an individual's confidence in himself, his crew, his aircraft or his ability to handle situations and can result in poor decisions while in flight. Pilot confidence is a very good thing; however, in Army Aviation, the saying "You can't have too much of a good thing" isn't always the case. A common example of overconfidence is continued flight in decreasing weather, which often leads to problems.

Crew coordination

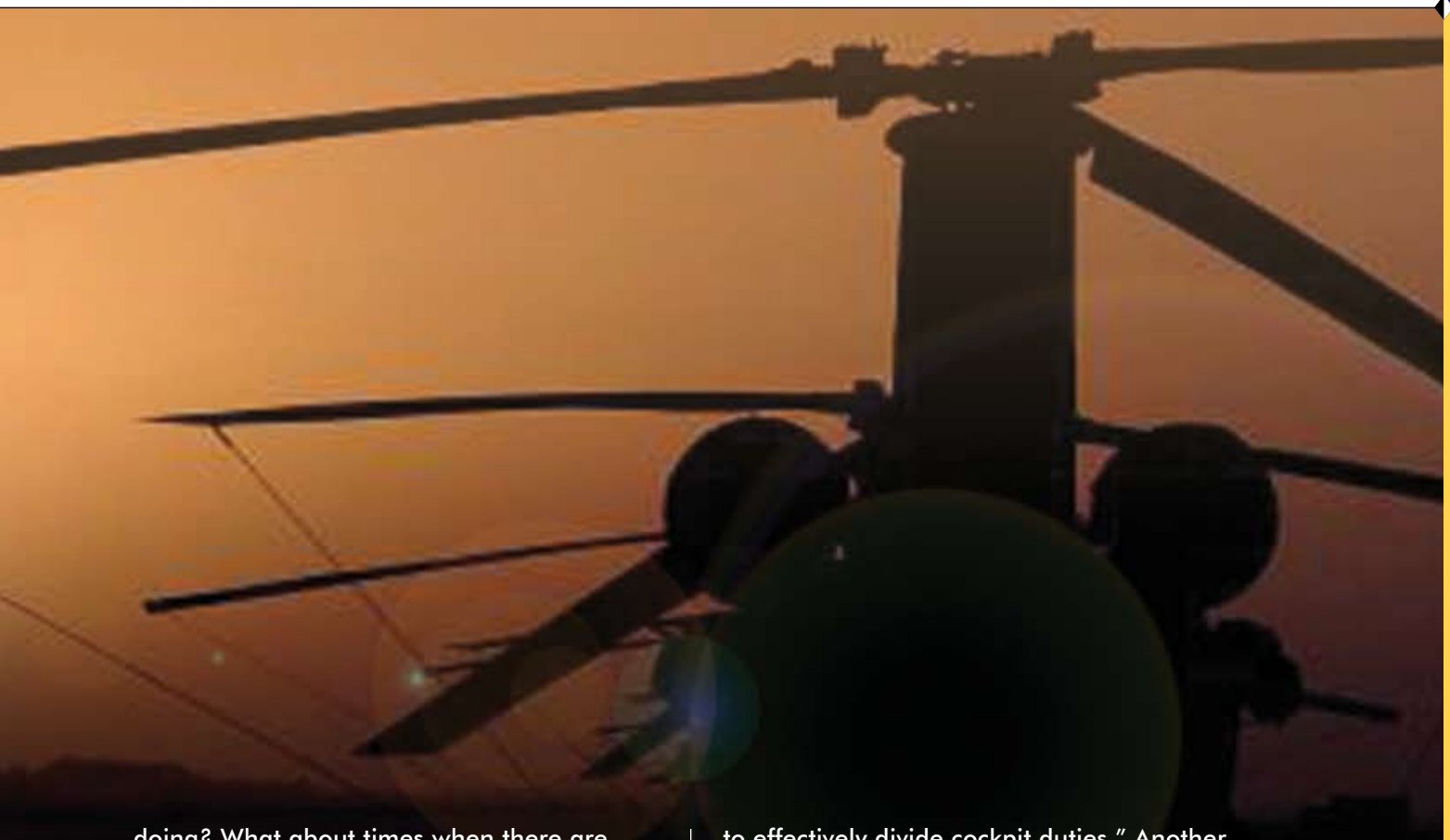
Thankfully, much attention and training have been geared toward improving crew coordination. The ability of crewmembers to distribute workload while flying and accomplish their missions is dependent upon their ability to communicate effectively. Unfortunately, there are other less-known crew issues that can adversely affect crew coordination.

"THE ARMY AVIATION ENVIRONMENT IS RIPE FOR HUMAN ERROR DUE TO SUCH FACTORS AS OPERATIONAL TEMPO AND THE ADDITION OF ADVANCED TECHNOLOGY IN THE COCKPIT."



Crew issues

The makeup of an aircrew can be an important factor in crew coordination. How often have you heard of situations where a student pilot said he assumed the instructor pilot had the controls or knew what he was



doing? What about times when there are experience or rank differences in the cockpit? Is it possible student pilots and junior officers are reluctant to question their co-pilots' actions, thus hampering crew coordination? In fact, accident investigators have found that oftentimes a pilot's confidence in his IP or higher-ranking co-pilot can hinder communication. For example, a pilot might refrain from providing obstacle clearance details because he thinks the other pilot's experience means he doesn't need assistance. However, because there had been a communication breakdown, what the pilots in these situations didn't know was their experienced co-pilot was involved with other tasks and needed their input.

Distraction due to workload

Workload in aviation operations is often high, especially with the technological advancements of recent years. The susceptibility to distraction while flying is always a great risk and a major contributor to individual failures. The need to maintain attention outside the aircraft is in conflict with the time taken to manage flight tasks with attention inside the aircraft. A brief review of accident findings shows that division of attention is extremely important. For example, in one accident the findings included statements that "both crewmembers were focused inside the cockpit" and "failure to effectively divide cockpit duties." Another accident with a completely different flight scenario was found to be the result of "attention diverted inside the cockpit" and "both of the crewmembers had focused their attention inside the aircraft." As you can see, these very similar findings indicate improper management of workload and cockpit attention is an important and common individual failure.

These individual failure descriptions are examples of how crewmember actions and attitudes can affect human error in Army Aviation accidents. You might be wondering how commonly individual failures actually are identified in the accident database. As it turns out, when looking at any given sample of aviation accidents within the last 15 or so years, we see human error is identified in about 80 percent of accidents classified as having a human error component.

This is not to say only individual failures are present. These numbers indicate at least one individual failure was identified by either the accident investigators or the author's research team; many of the accidents had a combination of failures including support, standards, training and leader failures. Nonetheless, it's important to remain aware of the importance of workload management, crew coordination and aircrew attitudes such as complacency and overconfidence to increase Army Aviation safety. ♦

Standardization STAC

UH-60 ACSI COURSE

This STACOM supersedes STACOM 06-09. As of Oct. 1, 2006, the UH-60 Aircraft Crewmember Standardization Instructor Course is the Department of the Army-approved and funded course for UH-60 non-rated crewmember flight instructors. Commanders are authorized to qualify a non-rated crewmember FI or SI as required at the unit level until Jan. 31, 2008.

For initial FI or SI qualification after Jan. 31, 2008, individuals must have satisfactorily completed the UH-60 ACSI Course (Non-rated Crewmember Instructor Course) or have an equivalency evaluation administered by Headquarters, Department of the Army (Directorate of Evaluation and Standardization) in accordance with Army Regulation 95-1, paragraph 4-33.b. FIs qualified before Jan. 31, 2008, may continue to perform duties as an FI as required by their command but are highly encouraged to attend the ACSI Course. To continue to perform duties as an SI after Jan. 31, 2008, personnel must have attended the ASCI (NCIC) or have satisfactorily completed an equivalency evaluation by DES.

Unit commanders will ensure their Soldiers are entered into the Army Training Requirements and Resources System for course enrollment in the ACSI Course, 600-ASIN1 (UH-60), school code 011, Fort Rucker, Ala., or school code 960, Fort Indiantown Gap, Pa. Requirements for the equivalency evaluation are as follows: Commanders will coordinate with DES (ATZQ-ES), Fort Rucker, before submitting a request for an equivalency evaluation to DAMO-AV. Equivalency evaluations will consist of all ACSI Course written tests, an academic evaluation and a flight evaluation conducted under all modes of flight. Evaluation study materials can be found on the DES portal at https://www.us.army.mil/suite/folder/6834557.

The DES point of contact for this STACOM is SFC Christopher Wood at (334) 255-1748 or e-mail woody.wayne.wood@conus.army.mil.

UH-60 and AH-64 TIRE INFLATION CAGE Now Available

Communication

COM Message 07-04

Standardization communications (STACOMs) are prepared by the Directorate of Evaluation and Standardization (DES), U.S. Army Aviation Warfighting Center, Fort Rucker, Ala. 36362-5208. Information published in STACOMs may precede formal staffing and distribution of Department of the Army official policy. Information is provided to commanders to enhance aviation operations and training support.

SCOTT B. THOMPSON
COL, AV
Director of Evaluation
and Standardization

MARTY CHARLIER
SENIOR TECHNICAL SPECIALIST FOR UTILITY HELICOPTERS
HUNTSVILLE, ALA.

An article in the March 2004 *Flightfax* recounted an accident involving two Soldiers performing routine tire servicing on the main gear of a UH-60. The Soldiers didn't have the proper equipment to inflate the tire and inadvertently overinflated it with nitrogen to the point of failure. The explosion shot large chunks of the magnesium wheel in all directions. One Soldier was hit in the lower torso and killed instantly, while the other Soldier's arms were severed above the elbow. The power released during the explosion was strong enough to lift the aircraft off the ground and cause significant damage to the airframe.

Fortunately, industry has developed a fix for this problem so the same accident doesn't happen again. The UH-60 program manager recently approved a new tire inflation cage for UH-60 and AH-64 aircraft that provides two additional levels of protection for the Soldier. First, it's portable and fits over the main or tail wheels and can be used with the wheels installed on the aircraft. Second, the device features an inline relief valve to prevent overinflation if other safety devices fail and a cage to contain the debris from an explosion or other catastrophic tire or wheel failure.

The cage can be requisitioned through normal supply channels using NSN 4920-01-545-0763 and part number SK2000TC-6. For more information on this product, contact Marty Charlier, Senior Technical Specialist for Utility Helicopters, at (256) 955-9735 or by e-mail at marty.charlier@us.army.mil. ♦

Accident Briefs

Information based on preliminary reports of aircraft accidents

Class A

AH-64
D Model

• Class A: The Two Soldiers suffered fatal injuries when their AH-64D crashed. The two pilots were in the lead of a two-ship, night-combat mission when their aircraft impacted the ground during a turn. A post-crash fire ensued.

DID YOU KNOW?

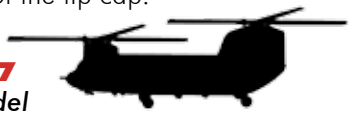
Good aircrew coordination practices can provide aircrews with tools to avoid errors and recover from potentially dangerous situations.

AH-64
D Model

• **Class B:** While conducting a ground run, the aircraft experienced an engine No. 2 overspeed. Engine No. 2 was started, but during the start sequence, the rotor brake broke lock and disengaged. The No. 2 power lever was pulled to the off position, but the engine continued to engage. The crew attempted to turn the engine off using the ENG CHOP collar, but the engine continued to overspeed while simultaneously beginning to roll and pitch left.

• **Class C:** The 30 mm gun came out of the stow position during landing and struck the ground, causing the turret assembly to separate from the aircraft.

• **Class C:** While conducting a combat mission, the crew heard a loud impact. The aircraft began to vibrate but was controllable, and the decision was made to return to the airfield. Upon landing and shutdown, it was determined a bird had struck the main rotor leading edge of the tip cap.



CH-47
D Model

• **Class C:** While in flight, the right pilot jettisonable door separated from the aircraft. The aircraft returned to the airfield and shut down without further incident. The door was recovered but was damaged beyond repair.

MH-47
E Model

• **Class C:** The aircraft struck a duck during a night vision goggle training flight, resulting in damage to the engine driveshaft and fairing.

OH-58
D(R) Model

• **Class B:** The aircraft broke through the ice during a landing on a frozen body of water. Structural damage was reported.

• **Class C:** The aircraft experienced a TGT spike (1,000 C) during startup.

• **Class C:** The aircraft sustained damage to the main and tail rotor blades during diving fire gunnery training. The damage was caused by the .50-caliber casings.

• **Class C:** The aircraft struck the ground hard during manual throttle operations and suffered damage to the landing gear.

TH-67
A Model

• **Class C:** The instructor pilot initiated a power recovery during termination of a standard autorotation. The aircraft yawed approximately 90 to 100 degrees to the right and landed hard on the tarmac, resulting in damage to the forward underbelly and fuselage at the forward bulkhead.

Initiate autorotation power recoveries in accordance with aircrew training manual or flight training guide standards.

UH-60
A Model

• **Class C:** The crew experienced a No. 2 engine oil pressure indication during runup. Inspection revealed the engine oil service cap had not been replaced. The engine had to be replaced.

Thorough preflight inspections and maintenance supervisory checks can preclude such minor incidents from causing major damage to Army equipment.

• **Class C:** The aircraft was taxiing to parking when the main rotor blade contacted the tail rotor of a parked aircraft. Both aircraft suffered damage.

Use a ground guide to ensure aircraft clearance in hazardous areas.

L Model

• **Class C:** A flock of birds struck the main rotor system. One of the main rotor blades was damaged and replaced.

• **Class C:** While attempting to open the aircraft's right-side cargo door, a passenger inadvertently pulled the emergency window release. The crew chief was able to secure one of the cabin windows, but the other window was pulled into the main rotor system by rotor downwash and vortices, causing

damage to the main rotor blades and cabin window.
Conduct a thorough passenger brief IAW the aircraft operator's manual and checklist.

• **Class C:** While performing a visual meteorological conditions approach to a dusty landing zone, all crewmembers lost visual contact with the ground and failed to notify the pilot in command, who was on the flight controls. On final termination of the approach, the aircraft drifted forward and struck a HESCO barrier.

RC-12

D Model

• **Class C:** After conducting a normal landing under visual flight rules conditions, the aircraft struck a pheasant during rollout. The bird ran onto the runway and directly into the right-hand propeller as the aircraft decelerated. The engine instruments all indicated normal after the impact, and the crew continued to operate the aircraft to a safe and normal stop and shutdown. Maintenance personnel determined the damage to the propeller and engine exceeded repairable limits. The engine and propeller were replaced.

N Model

• **Class C:** The crew struck a small deer just before rotation on a touch-and-go landing. The takeoff was aborted, and the runway was cleared without further incident.

UNMANNED AIRCRAFT SYSTEM

RQ-5A

• **Class A:** The Unmanned Aircraft System initiated uncontrolled flight during operator training. The recovery chute was deployed, but it separated from the airframe. The UAS landed hard and a postcrash fire ensued.

RQ-7B

• **Class B:** The UAS did not properly launch and landed about three feet in front of the launcher.

• **Class B:** The UAS failed to climb out and crashed shortly after launch.

• **Class B:** The UAS operator received "Generator Fail" and "Ignition Fail" alert messages during flight, and the engine RPM dropped to zero. The operator was able to land the system, which suffered damage in the incident.

• **Class C:** The Unmanned Aircraft System initiated uncontrolled flight during operator training. The recovery chute was deployed, but it separated from the airframe. The UAS landed hard and a postcrash fire ensued.

• **Class C:** The aerial vehicle operator experienced RPM decline and subsequent engine failure during flight. The recovery chute was deployed before ground impact.

RQ-11

• **Class C:** The operator lost computer link with the UAS during flight. The aircraft was never located and a total loss was reported.

• **Class C:** The UAS landed about 200 meters past the landing zone and was never recovered. A total loss was reported.

• **Class C:** The operators lost their signal with the aircraft and were unable to regain control, resulting in the loss of the UAS.

• **Class C:** The UAS would not respond to commands, failing to turn left or right. The aircraft was commanded to fly back toward the forward operating base, and contact was lost.

• **Class C:** The aircraft voltage fluctuated between 19 to 22 VDC during flight. Once voltage dropped below 19 VDC, the aircraft was directed to return home. The aircraft was within 1,400 meters of home station when the voltage dropped to 16 VDC, causing the operator to lose control.

• **Class C:** The aircraft completed the first two legs of a reconnaissance mission when wind and rain quickly developed. The operator noticed the remote video terminal was getting poor reception and tried to maneuver the aircraft back to the rally point. Contact with the aircraft was lost momentarily, regained for two minutes and then lost for good.

ARMY AIRCRAFT LOSSES FY02 TO PRESENT*

	HOSTILE/NON-HOSTILE	COST
AH-64A/D	12/44	$1.2B
U/MH-60L	7/24	$212.0M
C/MH-47	6/13	$718.9M
OH-58D	8/21	$181.2M
Total	33/102	$2.29B

*As of February 7, 2007

Editor's note: Information published in this section is based on preliminary loss reports submitted by units and is subject to change. For more information on selected accident briefs, call (334) 255-9552 or (334) 255-3410.

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